

TABLE 3.—Solar-radiation measurements, and determinations of atmospheric-turbidity factor, β , Washington, D.C., April 1933

[Values in italics have been interpolated]

Date and solar hour angle	Solar altitude, h.	Air mass, m.	I_m	I_s	L	β	Blue-ness of sky	Atmospheric dust particles per cubic centimeter	Notes: (sky-light polarization, P.) clouds, etc.
Apr. 3			<i>gr.cal.</i>	<i>gr.cal.</i>	<i>gr.cal.</i>				
4:44 a.	18-07	3.17	0.711	0.650	0.600	0.160			
4:56 a.	19-12	3.02	.758	.637	.507	.140			
4:24 a.	21-57	2.66	.946	.674	.559	.080			
4:20 a.	22-43	2.58	.956	.676	.562	.080			
3:34 a.	31-18	1.92	1.047	.767	.574	.085			
3:27 a.	32-33	1.87	1.107	.762	.578	.065			
Apr. 13									
5:22 a.	13-04	4.34	.877	.691	.559	.055			
5:18 a.	13-50	4.13	.913	.694	.665	.045			
5:08 a.	15-47	3.04	.971	.709	.603	.055			
5:01 a.	17-10	3.37	1.031	.715	.609	.040			
4:48 a.	19-41	2.95	1.041	.770	.629	.060			
4:45 a.	20-16	2.88	1.051	.773	.622	.060			
4:14 a.	26-14	2.28	1.158	.829	.665	.065			
4:06 a.	27-12	2.18	1.171	.834	.668	.065			
3:12 a.	37-38	1.63	1.256	.888	.712	.085			
3:09 a.	38-22	1.61	1.264	.888	.715	.085			
0:41 a.	58-46	1.17	1.458	.932	.772	.065			
0:37 a.	59-01	1.17	1.447	.834	.771	.070			
Apr. 20									
4:50 a.	22-00	2.65	1.108	.884	.637	.045			
4:44 a.	23-08	2.63	1.132	.790	.858	.040			
3:58 a.	32-01	1.88	1.216	.857	.692	.070			
3:53 a.	33-00	1.83	1.255	.864	.697	.070			
2:26 a.	48-57	1.32	1.394	.884	.762	.070			

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Perkins, and Mount Wilson observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millions of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column.]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1933							
Apr. 1 (Naval Observatory)	h. m.	o	o	o			
Apr. 2 (Mount Wilson)	13 11	+64.0	24.1	+5.0	93	-----	93
Apr. 3 (Naval Observatory)	12 50	+78.0	25.1	+5.0	128	-----	128
Apr. 4 (Naval Observatory)	10 40		No spots				
Apr. 5 (Naval Observatory)	11 41		No spots				
Apr. 6 (Mount Wilson)	11 11		No spots				
Apr. 7 (Naval Observatory)	12 25	+22.0	276.5	+3.0	8	8	8
Apr. 8 (Naval Observatory)	11 6		No spots				
Apr. 9 (Mount Wilson)	10 34		No spots				
Apr. 10 (Naval Observatory)	11 0		No spots				
	10 56		No spots				

AEROLOGICAL OBSERVATIONS

[Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during April were close to the normals in practically all cases. (See table 1.) At most stations and levels the relative humidity departures were small and of opposite sign to those for temperature.

Resultant free-air wind directions were generally close to normal, except at the extreme northwestern stations

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1933							
Apr. 11 (Mount Wilson)	11 0						
Apr. 12 (Naval Observatory)	13 17						
Apr. 13 (Naval Observatory)	10 35						
Apr. 14 (Naval Observatory)	11 51						
Apr. 15 (Mount Wilson)	9 10						
Apr. 16 (Mount Wilson)	11 0						
Apr. 17 (Naval Observatory)	13 6	-29.0	79.9	+10.0			62
Apr. 18 (Naval Observatory)	10 13	-18.0	79.3	+10.0			62
Apr. 19 (Harvard Observatory)	13 13	+9.5	92.0	+14.0			170
Apr. 20 (Mount Wilson)	12 30	+8.0	77.6	+10.0	7		170
Apr. 21 (Naval Observatory)	13 49	+22.0	87.6	+3.0			9
Apr. 22 (Naval Observatory)	11 59		79.7	+11.0			9
Apr. 23 (Naval Observatory)	13 23						
Apr. 24 (Naval Observatory)	11 4						
Apr. 25 (Naval Observatory)	11 47						
Apr. 26 (Naval Observatory)	10 30						
Apr. 27 (Naval Observatory)	10 18						
Apr. 28 (Naval Observatory)	11 4						
Apr. 29 (Naval Observatory)	11 52						
Apr. 30 (Naval Observatory)	12 42						
Mean daily area for April							18

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR APRIL 1933

(Dependent alone on observations at Zurich and its station at Arosa)

[Data furnished through the courtesy of Prof. W. Brunner, university of Zurich, Switzerland]

April 1933	Relative numbers	April 1933	Relative numbers	April 1933	Relative numbers
1-----	9	11-----	0	21-----	8
2-----	8	12-----	0	22-----	0
3-----	0	13-----	0	23-----	0
4-----	0	14-----	0	24-----	0
5-----	0	15-----	0	25-----	0
6-----	0	16-----	0	26-----	0
7-----	0	17-----	Ec 13	27-----	0
8-----	0	18-----		13 28-----	0
9-----	0	19-----	a 20	29-----	7
10-----	0	20-----		10 30-----	0

Mean: 30 days = 2.9.

a=Passage of an average-sized or smaller group through the central meridian.

b=Passage of a large group or spot through the central meridian.

c>New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.

d=Entrance of a large or average-sized center of activity on the east limb.

where northerly components predominated. Resultant velocities were above normal, except over the north-central and northeastern sections where they were below normal. The greatest excess in resultant velocities occurred over the southeastern section of the country.